**3GPP TSG-RAN WG2 Meeting #125 R2-** **241XXXX**

Athens, Greece, 26th Feb -1st Mar, 2024

**Agenda item: 7.2.6**

**Source: Huawei, HiSilicon**

**Title: Summary for [offline 401] MAC spec issues for R18 positioning**

**Document for: Discussion and Decision**

# Introduction

During RAN2#125,

The following tdoc has been submitted for the open issue lists for R18 positioning

* R2-2401189 MAC spec open issue list for R18 POS Huawei, HiSilicon

The following tdocs have been submitted under the agenda for MAC corrections

* R2-2400157 Discussion on MAC open issues for POS vivo
* R2-2400204 Discussion on the remaining issues on bandwidth aggregation for SRS CATT
* R2-2400229 Discussion on MAC open issue [CA#02] for NR Pos Lenovo
* R2-2400261 Discussion on MAC issues for SL positioning InterDigital, Inc.
* R2-2400283 Discussion on positioning MAC open issues Xiaomi
* R2-2400337 Discussion on the remaining issues for R18 positioning MAC spec Huawei, HiSilicon
* R2-2400363 Further considerations on MAC open issues Intel Corporation
* R2-2400680 Discussion on SL pos and BW in MAC ZTE Corporation
* R2-2400716 SL Positioning MAC Maintenance issues Lenovo
* R2-2400884 Remaining issues on SL-PRS transmission ASUSTeK
* R2-2400885 Discussion and correction regarding SL PRS resource request ASUSTeK
* R2-2400969 Remaining issues on MAC Samsung
* R2-2401056 MAC related remaining issues of SL positioning Sharp
* R2-2401108 Open issues on MAC specification LG Electronics Inc.
* R2-2401253 MAC Open Issue CA#02: MAC CE for activation/deactivation of aggregated SP SRS for positioning Qualcomm Incorporated
* R2-2401322 Addressing MAC open issues Ericsson
* R2-2401467 Discussion on Sidelink positioning MAC open issues OPPO

In this summary paper, we list the options that companies propose for the solution of the open issues.

# Discussion on the open issues

## Single/multiple transmission

*SL#06 FFS whether the MAC layer can determine to select multiple SL-PRS transmission when SL-PRS is triggered either by the peer UE or the UE’s own upper layer.*

*SL#07 FFS whether the MAC layer can determine to select single SL-PRS transmission when SL-PRS transmission is triggered by its own upper layer or by peer UE.*

***Proposal*: Confirm that multiple/single SL-PRS transmission can be triggered either by the UE’s own higher layer.**

***Proposal*: Multiple SL-PRS transmission can be triggered by peer UE’s SCI when the SCI indicates reservation period. Single SL-PRS transmission can be triggered by the peer UE’s SCI when the SCI does not indicate reservation period.**

***Proposal*: Down-select from the following options for the reservation period for multiple SL-PRS transmission when triggered by the peer UE’s SCI**

* **The reservation period equals to the reservation period in the SCI**
* **The reservation period is determined by the UE’s own higher layer by implementation**

## Delay budget and priority

*SL#10 FFS how the MAC entity determines the SL-PRS delay budget.*

***Proposal*: SL-PRS delay budget can be provided by location server (LMF or server UE) to the Tx UE when triggering SL-PRS transmission.**

*SL#15 FFS whether SL-PRS priority is determined by priority in the peer UE’s SCI or the UE’s own higher layer when the trigger comes from the peer UE’s SCI.*

*SL#16 FFS how SL-PRS priority is determined when SL-PRS is triggered by the UE’s own higher layer.*

***Proposal*: When SL-PRS transmission is triggered by SCI, down-select from the following two options:**

* **Option1: SL-PRS priority is equal to the priority in the peer UE’s SCI**
* **Option2: SL-PRS priority is determined by the UE’s own higher layer by implementation**

***Proposal*: When SL-PRS transmission is triggered by its own higher layer, SL-PRS priority is determined by the UE’s own higher layer by implementation**

## Minimum time gap for shared pool

*SL#11 FFS minimum time gap requirement on SL-PRS shared resource pool.*

***Proposal*: Similar to legacy MAC spec, introduce a RRC parameter for SL-PRS shared resource pool, to configure the minimum time gap between last symbol of SL PRS and the start of the first symbol of the PSFCH reception that is associated with the PSSCH transmission. Send an LS to RAN1.**

## Determination of SL-PRS ID

*SL#12 FFS how the SL-PRS resource is determined based on the list of RRC configured SL-PRS configurations, priority, PHY sensing and MAC layer random resource selection for resource allocation scheme 2.*

***Proposal*: SL-PRS ID is determined by the UE’s implementation considering the SL-PRS priority, delay budget and bandwidth request, etc.**

## SL-PRS in shared pool when acked

*SL#13 FFS whether SL-PRS occasion on SL-PRS shared resource pool can be cleared when the MAC PDU has been positively acked for resource allocation scheme 2.*

*SL#14 FFS whether SL-PRS occasion on SL-PRS shared resource pool can be cleared when the MAC PDU has been positively acked for resource allocation scheme 1.*

For the two issues above, since we have raised the issue in the LS to RAN1 and still waiting for the replies from RAN1, they don’t need to be discussed for now.

## TA validation for CA POS

*CA#01 FFS TA validation for positioning SRS transmission in RRC\_INACTIVE with positioning SRS bandwidth aggregation*

For this issue, the only proposal from companies are as follows:

***Proposal:* Confirm that legacy TA validation can be reused for positioning SRS bandwidth aggregation in RRC\_INACTIVE.**

***Proposal*: Confirm that different carriers belong to the same TAG. Send an LS to RAN1 for confirmation.**

## SP Positioning SRS activation/deactivation MAC CE

*CA#02 FFS whether to reuse the current MAC CE or design a new MAC CE for activation/deactivation of SP positioning SRS with multiple carrier indications*

***Proposal*: For activation/deactivation of SP positioning SRS with multiple carrier indications**

* **Option1: Reuse the legacy MAC CE SP Positioning SRS Activation/Deactivation MAC CE**
* **Option2: Design a new MAC CE for activation/deactivation of SP positioning SRS across multiple carriers**
* **Option3: Postpone the discussion on specific design of a new MAC CE to activate/deactivate the linked *SRS-PosResourceSets* until the related open issue (i.e., whether more than one combinations of aggregated *SRS-PosResourceSets* can be configured or not per UE) is resolved**

## MAC reset

This issue was not included within the open issue list but has been kindly proposed by R2-2400261

***Proposal*: SL MAC entity cancels the triggered SL-PRS resource request MAC CE upon upper layer indication of SL MAC reset.**

## Request for SL-PRS bandwidth

In RAN1#115, RAN1 made the following agreement [1] and sent an LS to RAN2 [2].

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| Agreement  Send an LS to RAN2 and RAN3 with the following:   * From RAN1 perspective, for scheme 1, it is important for the following request to be specified:   + a gNB is able to receive a request from either LMF or UE for SL-PRS bandwidth * Action to RAN2 and RAN3 to consider how to specify support for such request, if not already specified. |

In RAN2#123, RAN2 made the following agreement [3].

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| **Agreement**  When aperiodic/one-shot SL-PRS transmission is triggered for UE configured with Scheme 1 SL-PRS resource allocation, at least for the case when LMF is not involved in giving the grant, design a new MAC CE for the UE to send to the gNB for SL-PRS resource request. (12/14) FFS when LMF is involved. |

Furthermore, the following LS has been received from RAN3 R2-2400038, asking RAN2’s opinion whether need to support LMF’s request when LMF is involved.

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| RAN3 discussed the signalling design in RAN3 on SL-PRS resource allocation for scheme 1.  RAN3 would like to ask RAN2 whether LMF is involved in the SL-PRS resource allocation, and if yes, whether RAN2 expects NRPPa impacts. |

***Proposal*: Confirm with RAN1 LS to include the SL-PRS bandwidth in the SL-PRS resource request MAC CE.**

***Proposal*: Discuss whether to support request from LMF for SL-PRS bandwidth**

# Conclusion

In this contribution, we give a summary for the remaining issues for MAC spec for R18 positioning.

We propose the following can be confirmed during the online discussion in RAN2#125

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